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Multi-disciplinary Collaboration And The Use Of Technology in The Reduction Of Cardiac Surgical Site Infections

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Background

Organizational surgical site infections (SSI) for cardiac surgery cases revealed an opportunity for improvement when compared against national benchmarks. Outcome measures are SSI rates and events. Additionally, the length of stay increases in patients with SSI with the potential for additional therapies, treatments, and procedures. Financial repercussions of a cardiac SSI have been documented with a median cost of $136, 950 per case (Sochet et al., 2017).

Methods

Multi-disciplinary clinicians gathered for a rapid process improvement workshop (RPIW) and created a process map of the perioperative timeline, emphasizing variations in current practice and a gap analysis on evidence-based practice (EBP) guidelines.

Action plans, using improvement methodology were created in the following areas:

- Post-op Cardiac Incision Care
- Apparent Cause Analysis (ACA)
- Environmental Cleaning (ATP Testing)
- Sterile Technique-Back Table Drape
- Surgical Antisepsis-Standardized Preps
- Vancomycin Preop Timing
- Ultra-Violet Disinfection
- Closing Instrumentation
- Negative Pressure Wound Therapy

Figure 1 Chest Incision Care Algorithm

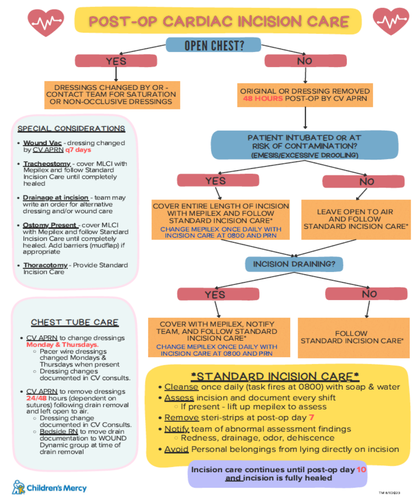
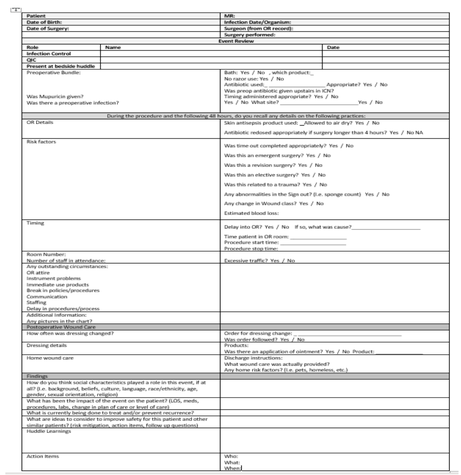


Figure 2 Apparent Cause Analysis (ACA) Form



Patient	MR:
Date of Birth:	Infection Date/Organism:
Date of Surgery:	Infection Onset (from OR record):
	Surgery performed:
	Event Review

Role	Name	Date
Infection Control		
OR		
Present at bedside huddle		

Preoperative Bundle:	Both: Yes / No ; which product:_____ No razor use: Yes / No Hair removal: _____ Appropriate? Yes / No Was preop antibiotic given upstairs in ICN? Timing administered appropriate? Yes / No Yes / No What site? _____ Yes / No
Was Mupuricin given? Was there a preoperative infection?	
During the procedure and the following 48 hours, do you recall any details on the following practices:	
OR Details	Skin antisepsis product used: __Allowed to air dry? Yes / No Antibiotic redosed appropriately if surgery longer than 4 hours? Yes / No NA
Risk factors	Was time out completed appropriately? Yes / No Was this an emergent surgery? Yes / No Was this a revision surgery? Yes / No Was this an elective surgery? Yes / No Was this related to a trauma? Yes / No Any abnormalities in the Sign out? (i.e. sponge count) Yes / No Any change in Wound class? Yes / No Estimated blood loss:
Timing	Delay into OR? Yes / No If so, what was cause?_____ Time patient in OR room: _____ Procedure start time: _____ Procedure stop time:
Room Number: Number of staff in attendance: Any understanding circumstances: OR attire Instrument problems Immediate use products Break in policies/procedures Communication Staffing Delay in procedures/process Additional information: Are pictures in the chart?	Excessive traffic? Yes / No
Postoperative Wound Care	
How often was dressing changed?	Order for dressing change: _____ Was order followed? Yes / No
Dressing details	Products: _____ Was there an application of ointment? Yes / No Product: _____
Home wound care	Discharge instructions: What wound care was actually provided? Any home risk factors? (i.e. pets, homeless, etc.)
Findings	
How do you think social characteristics played a role in this event, if at-all? (i.e. background, beliefs, culture, language, race/ethnicity, age, gender, sexual orientation, religion) What has been the impact of the event on the patient? (LOS, meds, procedures, labs, change in plan of care or level of care) What is currently being done to treat and/or prevent recurrence? What are ideas to consider to improve safety for this patient and other similar patients? (risk mitigation, action items, follow up questions) Huddle Learnings	
Action Items	Who: What: When?

Figure 3 Environmental Cleaning (ATP Testing)

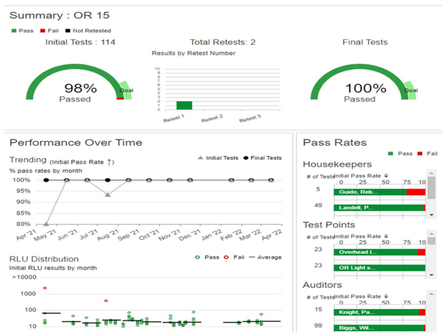


Figure 4 Sterile Technique-Back Table Drape

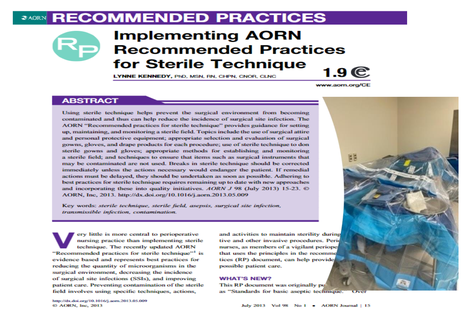


Figure 5 Vancomycin Preop Timing

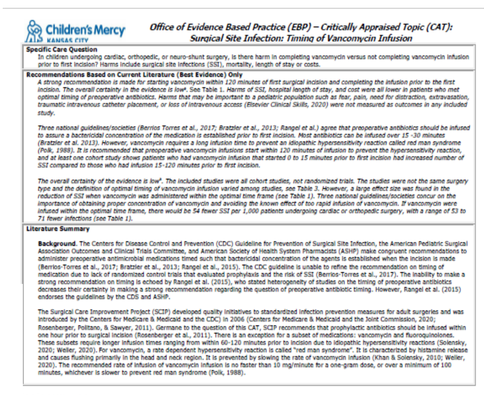


Figure 6 Ultra-Violet Disinfection

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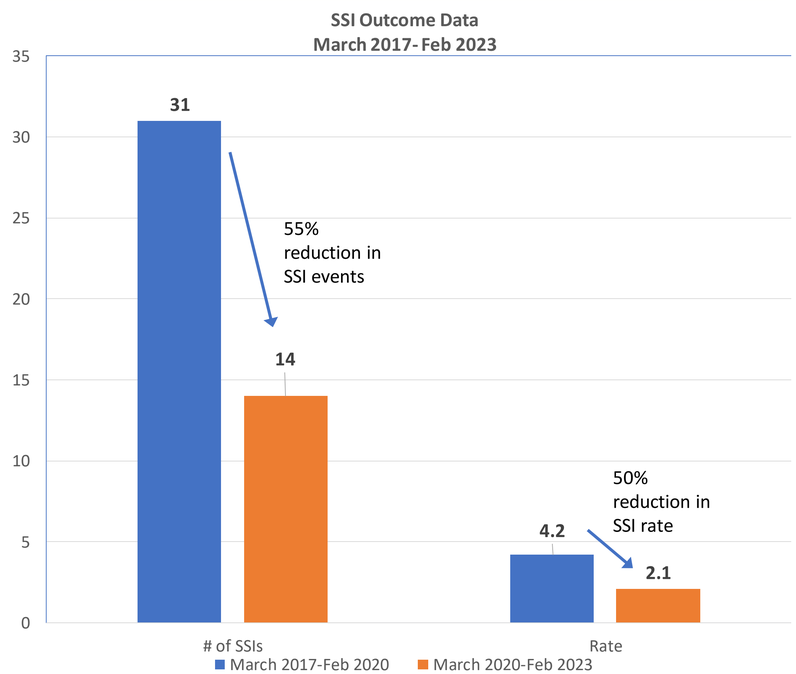
Results



Conclusion

Multi-disciplinary and evidence-based approaches proved to be successful with the spread to other surgical specialties. Improvement methodology has been used to monitor and sustain positive results. Advances in technology and equipment has led enhanced use of Ultra-Violet disinfection technology and negative pressure wound therapy.

Sochet, A. A., Cartron, A. M., Nyhan, A., Spaeder, M. C., Song, X., Brown, A. T., & Klugman, D. (2017). Surgical Site Infection After Pediatric Cardiothoracic Surgery. *World Journal for Pediatric and Congenital Heart Surgery*, *8*(1), 7–12. doi: 10.1177/2150135116674467

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